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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,308	04/06/2006	Uwe Schon	B1180/20053	7160

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EXAMINER	
AZIM, ABDUR RAHIM	
ART UNIT	**PAPER NUMBER**
3784	

NOTIFICATION DATE	DELIVERY MODE
03/23/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@crbcp.com

Office Action Summary	Application No.	Applicant(s)	
	10/595,308	SCHON ET AL.	
	Examiner	Art Unit	
	AZIM RAHIM	3784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *30,35,36,38-44 and 46-63* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *30,35,36,38-44 and 46-63* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *06 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 30, 38, 40-44, 46-49, 52, 53 and 56-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,335,503) in view of Boese (US 4,566,283), Thomas (US 6,389,828) & Brenik et al. (Brenik, US 4,397,158).

Regarding claims 30, 52 & 53, Lee discloses cooling equipment and method of operation [referring to figure 1] comprising: a) a cooling agent storage container [pressure vessel 16] housing a cooling agent [see column 4, lines 42-44: nitrogen]; b) a cooling agent supply line [nozzle 46] connected to the cooling agent storage container [illustrated in figure 1] for supplying the cooling agent to a cooling chamber [refrigerated compartment 14; as illustrated in figure 1, nozzle 46 is capable of performing this intended use function], said cooling chamber

having an opening [vent 60] to cool an item positioned adjacent the opening of the cooling chamber [as illustrated in figure 1, the structure of refrigerated compartment 14 is capable of allowing this function to be performed]. However Lee fails to disclose that the cooling chamber has an open bottom; a heater with an adjustable first heating performance for heating the cooling agent supplied, the heater integrated in the cooling agent supply line; an evaporator in the cooling agent storage container with an adjustable second heating performance for evaporating the cooling agent present in the cooling agent storage container; a temperature sensor for measuring an agent temperature of the cooling agent supplied to the cooling chamber; a first temperature sensor for measuring a chamber temperature in the cooling chamber; a controller for temperature control, the controller having an input side and an output side, the input side connected to the first temperature sensor and the second temperature sensor, the output side connected to the heater and the evaporator, wherein the controller: (i) is adapted to detect several temperatures as control variables; (ii) is a multiple controller adjusting the first heating performance and the second heating performance as manipulated variables. Boese teaches a low temperature device for cooling small samples [referring to figure 1] comprising a vessel [2], a tube [7] for supplying the nitrogen to a sample, an electrical resistance heater [6] disposed within the vessel, a heater [9] and a thermocouple [10] disposed within the tube [illustrated in figure 1]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Lee to include heaters disposed inside both the cooling agent storage container and the cooling agent supply line, and a thermocouple disposed within the cooling agent supply line the as taught by Boese in order to allow the temperature of the nitrogen in the vessel to be controlled, thus increasing the versatility of the

system. Also, Thomas [referring to figure 11] teaches a cooling agent storage container [feed chamber 503] containing a temperature sensor [550] for measuring the temperature in the cooling agent storage container [illustrated in figure 11]; a controller [553] for temperature control [via the controller's connection to temperature sensor 550], wherein the controller: (i) is adapted to detect temperature as control variable [column 10, lines 49-55; i.e. multiple temperature values]; (ii) is a multiple controller [as illustrated in figure 11, controller 553 is connected to several output components such as blower 512 and heater 547]; and (iii) adjusts a heating performance as a manipulated variable [column 10, lines 57-61; i.e. multiples stages of heating]; wherein the controller has an input side connected to the first temperature sensor [illustrated in figure 11], and an output side connected to a heater [547; illustrated in figure 11]. Also, the teaching of Thomas falls within the realm of common knowledge as obvious mechanical expedient, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Lee as modified by Boese to include a controller having the capability of using inputted temperature measurements from multiple temperature sensors to control heating performances of multiple heaters being connected to the output of the controller as taught by Thomas in order to provide automatic temperature control of the system, thus increasing operational efficiency. Brenik teaches a nozzle head [3] having an open bottom [via openings of blast nozzles 5], that is connected to a piping system [8], wherein the nozzle head is used to distribute a mixtunre of a cold cooling medium and air [see column 5, lines 36-54]. It is noted that the nozzle head is interpreted as being a cooling chamber. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Boese to

include an opening on the bottom of the cooling chamber as taught by Brenik in order to allow the vaporized nitrogen to more smoothly recirculate through the system while the system is vented.

Regarding claim 38, Lee discloses that the cooling agent is nitrogen [see the rejection of claim 30].

Regarding claim 40, Lee further discloses that the cooling agent supply line is adapted to empty via a diffuser [distributor manifold 36] into the cooling chamber [illustrated in figure 1].

Regarding claim 41, Lee further discloses that the cooling agent is adapted to be emptied laterally into the cooling chamber [as illustrated in figure 1, the nitrogen from pipe 8 would enter into the refrigerated chamber via nozzles 38].

Regarding claim 42, Lee further discloses that the cooling agent supply line is adapted to empty into the cooling chamber only on one side of the cooling chamber [illustrated in figure 1, the nitrogen is emptied from the top of the refrigerated chamber].

Regarding claim 43, Lee further discloses that the pipe is adapted to empty into the cooling chamber at the top of the cooling chamber [illustrated in figure 1].

Regarding claim 44, Lee further discloses that the cooling chamber is closed [illustrated in figure 1; while vent 60 is closed].

Regarding claim 46, Lee further discloses that the cooling chamber is portable [given the proper transport equipment, the whole of the cooling equipment can be transported].

Regarding claim 47, Lee as modified by Boese and Thomas teach all of the limitations of the claimed invention, and Thomas further teaches that the temperature sensor is arranged inside the cooling chamber and at an interval from a wall of the cooling chamber [as illustrated in

figure 11, temperature sensor 550 is disposed at a distance from the wall where the cryogen is injected].

Regarding claim 48, Lee as modified by Boese and Thomas teach all of the limitations of the claimed invention, and Thomas teaches that the first temperature sensor is fastened to the cooling chamber by holding equipment extending into the cooling chamber [as illustrated in figure 11, it is factual that temperature sensor 550 as to be mounted to the chamber in order for the sensor to be rigidly positioned therein].

Regarding claim 49, Lee as modified by Boese and Thomas teach all of the limitations of the claimed invention, and Thomas further teaches that the first temperature sensor is attached to a sample holder [the wall where temperature sensor 550 is disposed, and chamber 503 is capable of holding a sample].

Regarding claim 56 and 57, Lee as modified by Boese and Thomas teach all of the limitations of the claimed invention, and Thomas further teaches the controlling of the agent temperature of a cooling agent [509] entering into the cooling agent storage container in accordance with a target value set for the cooling chamber by adjusting the first heating performance [see column 10, lines 49-55].

Regarding claim 58, Lee further discloses a method of cryopreserving a biological sample comprising cooling the biological sample in the cooling equipment according to Claim 30 [see the rejection of claim 30].

Regarding claim 59, Lee as modified by Boese and Thomas teach all of the limitations of the claimed invention, and Brenik further teaches that the cooling chamber is bell-shaped [illustrated in figure 1].

Regarding claims 60 & 62, Lee further discloses that the cooling equipment is a non-recirculating cooling agent apparatus [as illustrated in figure 1, nitrogen from storage vessel does not recirculate].

Regarding claims 61 & 63, Boese as modified by Brenik and Thomas teach all of the limitations of the claimed invention, and Brenik further discloses that the cooling chamber has an open bottom [see the rejection of claim 30] for communication of the cooling agent to the atmosphere beyond the cooling equipment to reach and cool the item [as illustrated in figure 1, the cooling agent/air mixture exiting blast nozzles 5 can exit to the atmosphere around the cooling chamber].

4. Claims 35 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as modified by Boese, Thomas and Brenik as applied to claims 30 and 52 above, and further in view of Ritter (US 3,245,248).

Regarding claims 35 and 54, Lee as modified by Boese, Thomas and Brenik teach all the limitations of the claimed invention, and Thomas further teaches the multiple controlling of the first heating performance and of the second heating performance as a function of the different temperatures inside the cooling chamber [since controller 553 of Thomas is connected to multiple components as illustrated in figure 11, the controller is capable of receiving data from multiple temperature sensors to control the heater of Boese and the evaporator of Thomas]. Lee as modified by Boese, Thomas and Brenik fail to explicitly teach that several temperature sensors connected to the controller are provided for measuring the chamber temperature in the cooling chamber, and wherein the temperature sensors are arranged in a spatially distributed

manner for measuring a spatial distribution of temperature. Ritter teaches a cryogenic temperature control apparatus [figure 1] that includes a controller (12) that is integrally connected to two temperature sensors (thermometers 21 and 15). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Lee as modified by Boese, Thomas and Brenik to include the multiple temperature sensors as taught by Ritter in order to record the temperature distribution within the chamber, thus enabling the controller to adjust the temperature accordingly.

5. Claim 36 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as modified by Boese, Thomas, Brenik and Ritter as applied to claims 34 and 52 above, and further in view of Sitte et al. (US 6,178,757).

Regarding claims 36 and 55, Lee as modified by Boese, Thomas, Brenik and Ritter teach all the limitations of the claimed invention, and Thomas further teaches the measuring of temperature using a thermocouple [column 6, lines 49 and 50]; the multiple controlling of the first heating performance and of the second heating performance as a function of the different temperatures inside the cooling chamber [since controller 553 of Thomas is connected to multiple components as illustrated in figure 11, the controller is capable of receiving data from multiple temperature sensors to control the heaters of Boese]; and measuring with a thermocouple the chamber temperature and the agent temperature prior to the introducing step [column 10, lines 49-55]. Lee as modified by Boese, Thomas, Brenik and Ritter fail to teach that at least one of the temperature sensors is a temperature-dependent electrical resistor. Sitte et al. teach a cooling chamber temperature control device that utilizes a platinum resistor temperature

sensor to measure the temperature of a specimen [column 1, lines 38-42]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Boese as modified by Brenik, Thomas and Ritter and Ritter to include the use of a temperature dependant electrical resistor as taught by Sitte et al. in order to effectively measure a wide range of temperatures, thus increasing the accuracy of temperature measurement.

6. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as modified by Boese, Thomas and Brenik as applied to claims 30 above, and further in view of Hammerstedt et al. (US 6,065,294).

Regarding claim 39, Lee as modified by Boese, Thomas and Brenik teach all the limitations of the claimed invention, but fail to explicitly teach that the first temperature sensor and the second temperature sensor are connected to storage equipment that stores the temperature courses. Hammerstedt et al. teach a system to facilitate cryopreservation that includes a controller (48) that includes a microprocessor (64) that stores temperature data that is stored in memory for intervals of time [see figure 4 and column 5, lines 18-25]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Lee as modified by Boese, Thomas and Brenik to include a memory that stores temperature courses as taught by Hammerstedt et al. in order to control the temperature of the chamber based on past temperature trends, thus increasing the overall efficiency of the system.

7. Claims 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as modified by Boese, Thomas and Brenik as applied to claims 30 above, and further in view of Bash et al. (US 7,031,154).

Regarding claims 50 and 51, Lee as modified by Boese, Thomas and Brenik teach all the limitations of the claimed invention, but fail to teach that the first temperature sensor is connected to a transponder that transmits a measured temperature in a wireless manner to the control device; and wherein the transponder is selected from the group consisting of a radio transponder, an ultrasonic transponder, an optical transponder and an infrared transponder. Bash et al. teach the well known concept of providing temperature sensors (122 and 124) in a cooling system that communicates with a controller (104) through wireless shortwave radio communication [column 9, lines 1-10]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the cooling equipment of Lee as modified by Boese, Thomas and Brenik to include the transmitting of temperature data wirelessly to a controller as taught by Bash et al. in order to eliminate the use of wires, thus reducing operating costs.

Response to Arguments

Applicant's arguments, seepages 8-14 of the Applicant's Remarks, filed 8/10/2011, with respect to the rejection(s) of claim(s) 30 & 52 under 35 U.S.C. 103(a) as being unpatentable over Boese as modified by Brenik and Thomas have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new

ground(s) of rejection is made under 35 U.S.C. 103(a) as being unpatentable over Lee as in view of Boese, Thomas and Brenik

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681 or Cheryl Tyler at 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./
Examiner, Art Unit 3784
3/12/2012

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3784